

**Remarks:**

In the Office Action mailed on 16 October 2009, the Examiner rejected Claims 1, 5-7, 10, 12-17, and 19-32. Claims 2 and 3 have previously been withdrawn. Claims 1-3, 5-7, 10, 12-17, 19-32 are pending in the application.

**35 USC 103(a)**

Claims 1, 5-7, and 20 stand rejected as unpatentable under 37 CFR 103(a) over Wu (US 4,970,565), hereinafter Wu. Applicants traverse the rejection.

Claim 1 recites:

1. A chip for a chip-containing portable article comprising:
  - a silicon substrate layer having an active face with circuits integrated therein defining a central processor unit and memories; and
  - an additional layer of silicon that:
    - is sealed to the active face of the silicon substrate layer by a sealing layer;
    - covers at least part of said active face; and
    - comprises physical means for providing physical protection against the action of electromagnetic radiation in the infrared range at a wavelength longer than 1  $\mu\text{m}$ .

“Section 103 forbids the issuance of a patent on an application when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’”

*KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734, 82 USPQ2d 1385, 1391 (2007)

(cited in, *Ex Parte Carolyn Ramsey Catan*, No. 2007-0820, \_\_\_ USPQ2d \_\_\_ (B.P.A.I. 2007); see also *Graham v. John Deere Co.*, 383 U.S. 1, 14, 86 S. Ct. 684, 15 L. Ed. 2d 545 (1966); *In re Dembiczak*, 175 F.3d 994, 998 (Fed. Cir. 1999).

In *Graham* “the Court set out a framework for applying the statutory language of § 103.” *KSR* at 1734, 82 USPQ2d at 1391. “The analysis is objective:

‘Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or non-obviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.’” *KSR* at 1734, 82 USPQ25 at 1391, *quoting Graham* at 17-18, 86 S. Ct. 684, 15 L. Ed. 2d 545.

As noted in *Catan* “[the] Supreme Court made clear that ‘[f]ollowing these principles may be more difficult in other cases than it is here because the claimed subject matter may involve more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement.’” *Catan* at 10, *quoting KSR* at 1740, 82 USPQ2d at 1396. “Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the

fashion claimed by the patent at issue... [T]o facilitate review, this analysis should be made explicit.” *Catan* at 10, quoting *KSR* at 1740, citing *In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006).

While the *KSR* court addressed the applicability of the teaching, suggestion, motivation test in obviousness analysis, the *KSR* court did not head-on address the “all elements” aspect of the obviousness analysis. Prior decisions have stated that requirement as follows:

“a searching comparison of the claimed invention – *including all its limitations* – with the teaching of the prior art.” *In re Ochiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995) (emphasis added). Thus, “obviousness requires a suggestion of all limitations in a claim.” *CFMT, Inc. v. Yieldup Intern. Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003) (*citing In re Royka*, 490 F.2d 981, 985 (CCPA 1974)).

*Graham Analysis:*

Scope and Content of the Prior Art.

Wu addresses the need to seal a memory cell from ultraviolet light for the purpose ensuring that a programmable memory cell is not erased. Wu, Col. 1, lines 15-18 (“it is often desirable to have some memory cells completely sealed from ultraviolet light or other radian energy so that these cells can store charge in their floating gates permanently”), Col. 1, Lines 57-61 (“It is an object of the present invention to provide shielded memory cells in an EPROM device which are totally sealed from ultraviolet light, while still providing the necessary source, drain, and gate connections to external circuitry”). To accomplish that goal, Wu proposes a structure that includes a radiation shield or cover 18 made of conductive material such as aluminum, another metal, or p-type doped polysilicon (Col. 3, Lines 12-16). The conductive cover provides contacts with source and drain regions of a memory cell.

The sealed memory cells further include a glass element 51 that covers the source, drain, floating gate and associated connections. Contact holes 53 are opened in the glass layer to provide conductive connections through the glass layer where needed.

Differences between the prior art and the claims at issue.

1. Protection against UV light v. IR light

Wu is focused on the protection against UV light whereas the Applicants' claim "physical means for providing physical protection against the action of electromagnetic radiation in the infrared range at a wavelength longer than 1  $\mu\text{m}$ ". For example, Wu states that "it is an object of the present invention to provide shielded memory cells in an EPROM device which are totally sealed from ultraviolet light." Col. 1, Lines 57-59. The Examiner has made note of that Wu does not teach that the electromagnetic radiation protected against by Wu is in the IR range. Office Action, Page 4, Lines 3 – 4. While Wu does state that the cover 18 blocks UV and other radiant energy, Wu is silent on what that other radiant energy would be, the wavelength of that radiant energy, and the purpose of shielding against that other radiant energy. Applicants disagree with the Examiner that the other radiant energy encompasses light of a specific wavelength range such as the infrared range at a wavelength longer than 1  $\mu\text{m}$ . Office Action, Page 4, Lines 13 – 14. There simply is no disclosure in Wu supporting that assertion. The Examiner is engaging in a kind of inherency argument, i.e., that because Wu states "other radiant energy" that includes IR at a wavelength longer than 1  $\mu\text{m}$ . However, a teaching is only inherent from a disclosure if that is the only possible inference drawn from the teaching. That is not the case with Wu. "Other radiant energy" can mean anything other than UV, e.g., visible light. Considering that IR and UV are at opposite ends of the light spectrum, one would be more likely to consider "other radiant energy" to be radiation more near lying to UV light, e.g., visible light. Thus, it is improper to read a disclosure that the cover 18 shields against UV light.

2. Chip v. cell

Applicants claim "a chip" and elements directed to the chip level. Wu, on the other hand, is directed to a memory cell. Thus, applicant's elements of a silicon substrate with an active face with circuits integrated therein ... and an additional layer of silicon that is sealed to the active face, covers at least part of said active face" are elements that carry across many circuit elements or cells. Wu's disclosure, on the other hand deals

with the specific structure of individual cells that are to be protected against UV radiation. Accordingly, the active face of the substrate includes many circuit elements and a layer that covers at least a part of said active face would cover many circuit elements. Wu discloses a structure for specific cells.

3. Wu discloses a sealed memory cell. Wu uses the term “sealed” relative to ultraviolet light (Col. 1, Lines 58 – 61). In Wu the shielding against ultraviolet light is performed by the conductive layer 18. Applicants claim that the additional layer of silicon is sealed to the silicon substrate with a sealing layer. The Examiner asserts that Wu’s layer 51 is the sealing layer. However, that cannot be a correct reading of Wu. Wu’s layer 51 is a boron/phosphorous-doped silicon glass layer with openings through which the conductive radiation shield 18 may contact contact regions 19 and 31. Thus, it is not the layer 51 that provides “sealing” in the sense taught by Wu and the layer 51 does not provide a seal between the conductive radiation shield 18 and the substrate having circuit elements thereon.

Given the above-described differences between the claimed invention and Wu, it must be concluded that Wu does not provide a suggestion of the limitations recited in the claim. Wu does not provide for a teaching or suggestion of protecting against IR radiation and Wu’s layer 51 does not provide a sealing layer. Furthermore, Wu does not teach or suggest elements at the chip level but rather structures for a cell that is just one small component of a chip. Therefore, a person skilled in the art would not be motivated by Wu to arrive at Applicants’ claimed invention.

The Examiner asserts that the ordinary artisan would have been motivated to modify Wu for at least the purpose of providing protection to the device that may be sensitive to incident light of the specific wavelengths. That would first require that the person would recognize the need for protecting against light other than UV light. Wu does not state anything to indicate a vulnerability to exposure to other forms of electromagnetic radiation. Second, there would have to be a recognition that modifications would be possible to cause Wu’s radiation shield or cover 18 to block against IR radiation. Third, a modification would have to be made to Wu to include the

sealing layer of applicants' claim. As noted above, the element of Wu that the Examiner proposes as a sealing layer cannot be considered equivalent to applicants' sealing layer. Furthermore, the person of ordinary skill seeking to protect areas of an active face of a silicon substrate would not be likely to look at the design for individual cells of a memory circuit. Thus, it would not be obvious to a person of ordinary skill in the art to look to Wu for such teachings and it would not be obvious to a person of ordinary skill that it would be possible to modify cell-level architectural features designed to protect individual cells to protect entire chips.

For the foregoing reasons, Claim 1 is patentable over Wu. Claim 20 provides analogous limitations and is patentable over Claim 1 at least for the reasons given in support of Claim 1. Claims 5-7 depend from Claim 1, incorporate all the limitations thereof, provide further unique and non-obvious combinations, and are patentable over Wu for the reasons given in support of Claim 1 and by virtue of such further combinations.

Returning to the notion of applying Wu's disclosure to protection against IR radiation. Against, claims 6, 21-23, and 26-28 the Examiner cited the combination of Wu and Kuehnle. Kuehnle teaches manipulation of dopant concentrations to block certain categories of wavelengths. However, Kuehnle does not teach concentrations useful to protect against IR radiation greater than 1  $\mu\text{m}$ . Therefore, a person looking at the combination of Wu and Kuehnle would be no wiser as to how to achieve protection against IR radiation.

For the foregoing reasons, Claim 1 is patentable over Wu in view of Kuehnle. Claim 26 provides analogous limitations to those set forth in Claim 1 and provide additional unique and non-obvious combinations, and is patentable over Wu in view of Kuehnle for at least the reasons given in support of Claim 1. Claims 6, and 21-23 depend from Claim 1, Claims 27 and 28 depend from Claim 26. These dependent claims incorporate all the limitations of their respective base claims, provide further unique combinations and are patentable over Wu and Kuehnle taken in any combination for the

reasons given in support of their respective base claims and by virtue of such further unique combinations.

Claims 10, 12-13, 24 and 29 stand rejected under 35 USC 103(a) as unpatentable over Wu in view of Kobachi (US 5,811,797), hereinafter Kobachi. As discussed hereinabove, there is no teaching in Wu to protect against IR radiation. There is also no motivation to a person of ordinary skill to make such a modification to Wu. Therefore, even if Kobachi provides a teaching of how to shield using surface irregularities, there is no reason a person of ordinary skill in the art would seek to protect the cell in Wu against IR radiation using the teaching of Kobachi. Furthermore, the other observations given above with respect to Wu apply here as well. Thus, for all these reasons, Claim 1 is not obvious over the combination of Wu and Kobachi. Claim 29 provides analogous limitations to Claim 1 and provide further unique recitations. Claim 29 is patentable over Wu and Kobachi at least for the reasons given in support of Claim 1. Claims 10, 12-13, and 24 depend from Claim 1, inherit all the limitations of Claim 1, provide further unique combinations, and are patentable over Wu and Kobachi for at least the reasons given in support of Claim 1.

Claims 14-17, 19, and 30 – 32 stand rejected over the combination of Wu and Ishikawa (U.S. 5,394,014), hereinafter Ishikawa. The arguments in support of Claim 1 with respect to Wu are incorporated here. Ishikawa does not teach or suggest a reason to modify Wu to protect against IR radiation. Thus, a person of ordinary skill would not be motivated to modify Wu by combining therewith the teaching of Ishikawa. Accordingly, Claims 1 and 30 are patentable over Wu in view of Ishikawa for the reasons given in support of Claim 1. Claims 14 – 17, and 19 depend from Claim 1 and are patentable over Wu and Ishikawa at least for the reasons given in support of Claim 1 and in view of further unique combinations provided by these respective dependent claims. Similarly, Claims 31 and 32 depend from Claim 30 and are patentable over Wu and Ishikawa at least for the reasons given in support of Claim 1 and in view of further unique combinations provided by these respective dependent claims.

### Conclusion of Argument

Appellants have argued hereinabove that the rejections under 35 USC 103(a) are improper and that the claims are patentable over the prior art. Accordingly, Applicants respectfully request reconsideration of the rejections of Claims 1,5-7, 10, 12-17 and 19-32 and their early allowance.

Respectfully Submitted,

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